THE HORN SPEAKER

JANUARY, 1974

E.H. SCOTT AND HIS 30 TUBE PHILHARMONIC

VOL. III No. 1 (50) JANUARY, 1974 Monthly except during July and August Price $3.00 yearly Single Issue 50¢

Second-class postage paid at Dallas, Texas Office Address: 9820 Silver Meadow Drive, Dallas, Texas 75217

Publisher, Jim Cranshaw

214-286-1673

NOTE:?

THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER

THE SCIENTIFIC USE OF THE PHONOGRAPH.

BY GEO. M. HOPKINS.

One of the uses to which the phonograph is peculiarly adapted is measuring the velocity of sound. From the nature of the instrument it is necessary that the sound be propagated in a confined space, and that this space begin and end at the mouth piece of the phonograph, to allow of making two distinct records on the wax cylinder, one of the sound as it is made directly in the mouth piece, the other of the same sound after it has traveled through the tube and returned to the mouth piece.

The accessories for this experiment are few and simple. The funnel, or auxiliary mouth piece, is in this case connected with the phonograph mouth piece by a flexible tube, and the funnel is suspended so as to cause it to maintain a fixed position, while the phonograph mouth piece and recording stylus traverse the record cylinder.

A forked tube, terminating in the flaring mouth piece, is connected by one of its branches with a long tube which extends away from the phonograph and, returning parallel with itself, enters the suspended funnel. The other branch of the forked tube opens directly into the funnel. The long tube is supported at suitable intervals, and in front of the flaring mouth piece is placed a bell, which is damped so as to produce only a momentary sound.

The phonograph is set in operation in the usual way, with the record cylinder revolving at a speed of say two revolutions per second. Now if a sound of sufficiently short duration is produced by the bell, the two records made, one by the sound entering directly into the phonograph mouth piece, the other by the sound traveling through the long pipe before reaching the mouth piece, will be distinct and separable on reproducing the record with the cylinder revolving at a slower speed, say sixty revolutions per minute. The interval between the records may be accurately measured in the manner described in a previous article.

In this way, knowing the length of the tube, the velocity of the sound in the tube is readily ascertained. A tube fifty feet long will show an interval between the records of one twenty-third of a second when the phonograph cylinder makes two revolutions per second. This is an appreciable interval, but when the speed of the cylinder is reduced one-half, the record shows double the interval. The interval may, of course, be increased by lengthening the tube, and it may be made more apparent by increasing the speed of the phonograph cylinder while recording, and greatly reducing the speed while reproducing the record.

The well known experiment in which the interference of sound waves produces silence may be readily adapted to the phonograph. The double tube is connected by one end with the phonograph mouth piece, and by the other with an ear piece. A record of a continuous musical note being in place on the phonograph, and adjusted so as to give a continued sound, the length of the adjustable tube is increased until the waves in that branch travel through half a wave length more than those in the other branch. Under these conditions the waves from the two branches, meeting in opposite phases in the ear tube, neutralize each other, and silence, or a close approximation to it, is the result.

In Fig. 2 is shown a simple device, by means of which the conductivity of gases for sound may be tested. A flexible gas-tight tube is connected by one end with the phonographic diaphragm cell, while the opposite end of the tube is attached to an ear piece consisting of a diaphragm cell provided with a very thin rubber diaphragm. In the side of the flexible tube, at opposite ends, are inserted smaller rubber tubes for changing the gas in the flexible tube. Each of the small tubes is provided with a pinch cock for shutting off the gas in the larger tube.

When the tube is filled with air the sound is conveyed with perceptible diminution. When hydrogen is substituted for the air, the sound is diminished so as to be scarcely audible. Other gases produce different results.

SCIENTIFIC AMERICAN, AUGUST 16, 1890

NEW ENGLAND WIRELESS MUSEUM

Robert Merriam at East Greenwich, Rhode Island, maintains a museum that demonstrates the history of radio, with a significant collection of historical interest. Merriam's wife, Nancy, manages one of the best collection of rare radio books.

Recently the Antique Wireless Association awarded the Merriams with the Houck Award, a yearly award for historical documentation and historical preservation. Gerald Tyne of Berkeley Heights, New Jersey, who wrote the articles SAGA OF THE VACUUM TUBE, is the 1973 recipient of the historical documentation award.

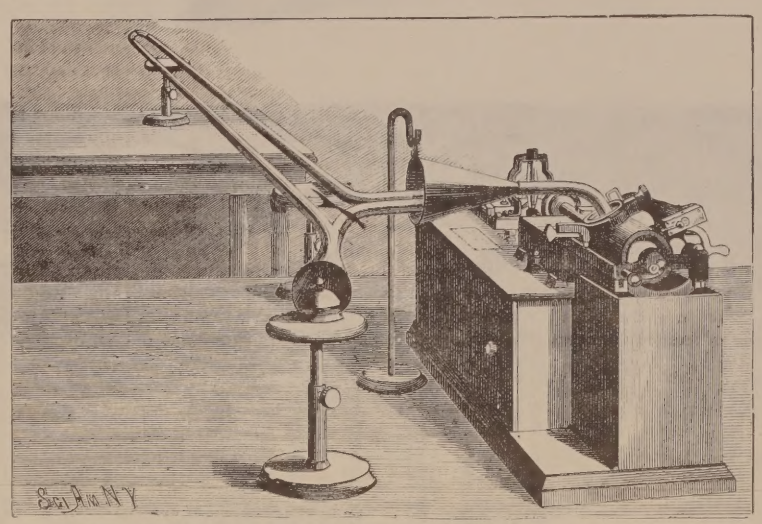


Fig. 1.—MEASURING THE VELOCITY OF SOUND BY THE PHONOGRAPH.

CHAPTERS FOR PHONO COLLECTORS

The American Phonograph Collecting Society is in the process of forming state and regional chapters with the help of dedicated members.

Paul Bosco at 43 Brainard Pl., Manchester, Connecticut 06040 is looking for members to form a Connecticut chapter of the APCS.

Ray Stone, 12410 Downer Drive, Wheaton, Maryland 20906 wants to form a chapter for the Washington, D. C. area (including Maryland and northern Virginia.)

The San Francisco Chapter of the APCS held three meetings last year. To join the San Francisco Chapter contact David W. Fletcher, at P. O. Box 5046, Berkeley, Cal., 94705, which is the central address of the APCS.

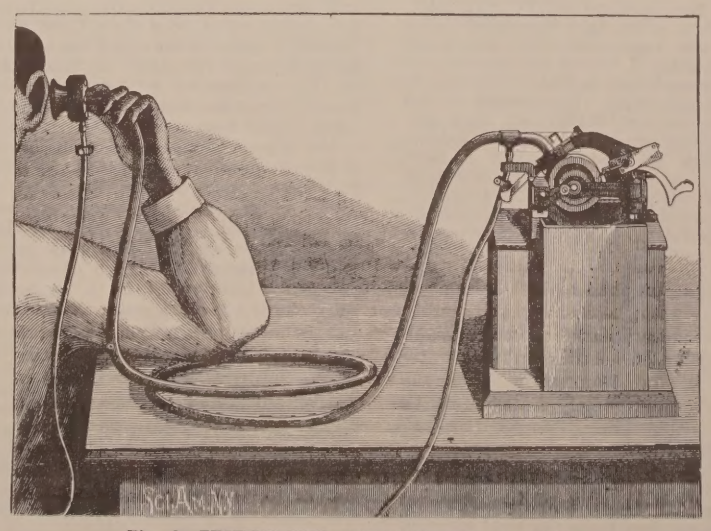


Fig. 2.—TESTING THE CONDUCTIVITY OF GASES.

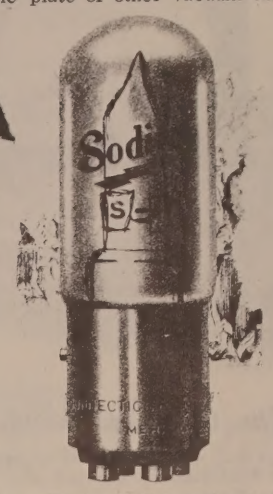
NEW LEADERS

The Rocky Mountain Antique Wireless Club has gained two new leaders, Bernard (Barney) T. Wooters as president and Harry Neilsen as secretary. Barny said that the club should proceed with plans for displays, contests, etc.

THE TUBE WITH AN INNER TUBE

BY WILLIAM E. HEMRICK

The Sodion S-13 detector tube differs from other tubes not only in its construction but also in its operating characteristics. There is an inner and an outer glass tube. The anode corresponds with the plate of other vacuum tubes.



The collector is U shaped and within it is the filament. In series with the filament, is a coil consisting of a few turns of resistance wire, which, when the filament circuit is completed, supplies the necessary heat for the proper operation of the tube. The coil is non-inductively wound and it is placed between the outside of the inner glass tube and the inside of the outside glass tube. The supporting wires for the elements of the sodion tube are held in position by a glass bead. The inner tube and its elements are placed in an outside glass bulb and as much as possible of the air is removed from the inner tube. A small quantity of sodium is introduced into the tube, which is then sealed, fastened to the base with the terminals of the elements connected to the terminals in the tube base.

The sodion tube has a specially treated filament that requires but 1/4 ampere for proper emission at a pressure of approximately 3.4 volts. The anode circuit requires a 22-1/2 volt battery. This tube will not oscillate, no interference will be produced by sets in which this tube is used alone. The clearness of the signal compares favorably with that obtained with crystal detectors and the strength of the signal is practically the same as with a regenerative receiver. The Sodion S-13 tube is very effective in radio receiving circuits as a detector.

How to Make a Talking Machine

OF SIMPLE CONSTRUCTION.

BY C. W. NOYES. 1905

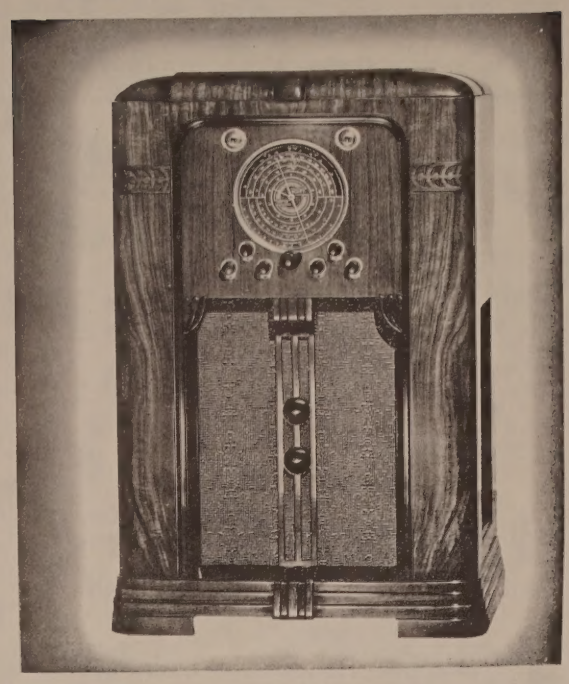
THE "Talking Machine" is no longer a novelty but has become a necessary article to a great many people. In the parlors of many persons grand overtures, beautiful waltzes, exquisite operatic selections and the highly artistic records of well known speakers, vocalists, comedians, dramatists and tragedians are all poured forth in the perfection of their original harmony and excellence by this incomparable instrument. Its listeners are entranced by an infinite variety which "age cannot wither nor custom stale." Who could invent a more interesting or delightful feature of amusement in a parlor of refined people? The instrument (contrary to public opinion) is very simple and the writer will endeavor in the following article to describe how a simple talking machine may be constructed at very little expense.

First procure a piece of hard wood 8″ by 10″, this is for the base and should be well seasoned to prevent warping, also procure a piece of hard

Continued on page 4

The Warrington

The graceful lines make this one of our most exquisite consoles in rotary cut and striped Walnut Veneer.



The Secretaire

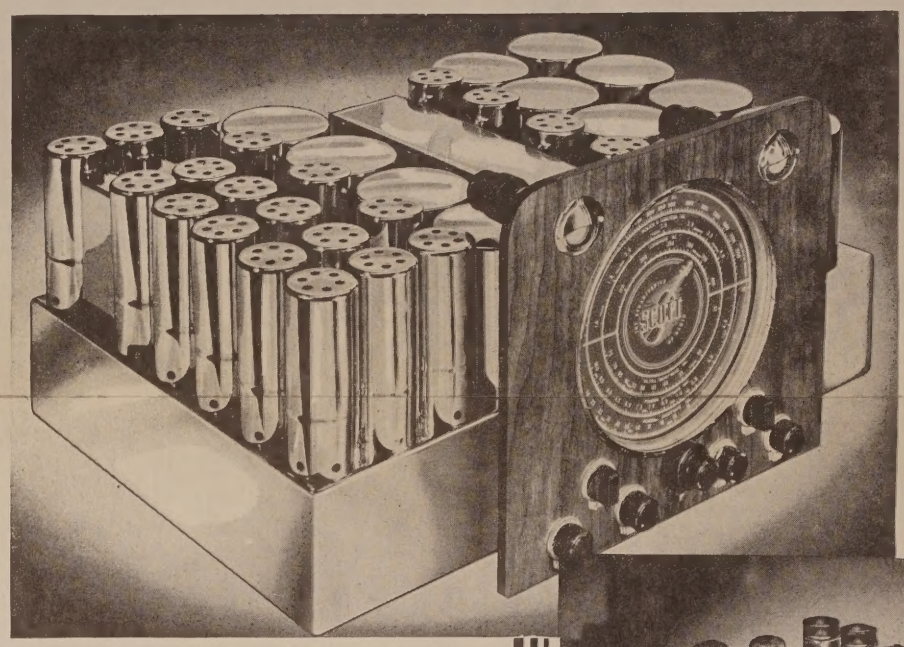
A Console designed to add distinction to the finest home—built in selected Butt and Figured Walnut.

The Gothic Grande

Subdued richness characterizes the classic Gothic in selected American Walnut with Linen-Fold panels.

The Waverly Grande

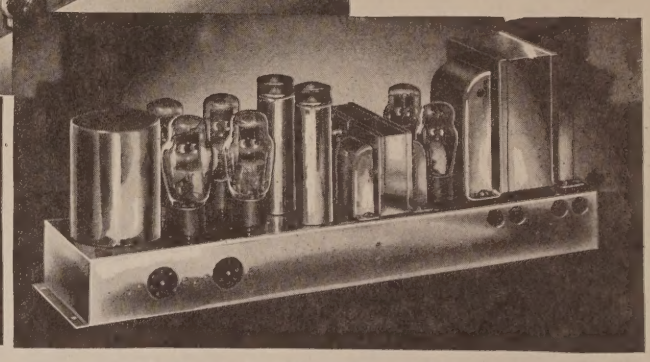
A delightful cabinet styled in authentic Swedish Moderne, of selected and Figured American Walnut.



Chassis of Precision Built Scott Philharmonic

1939

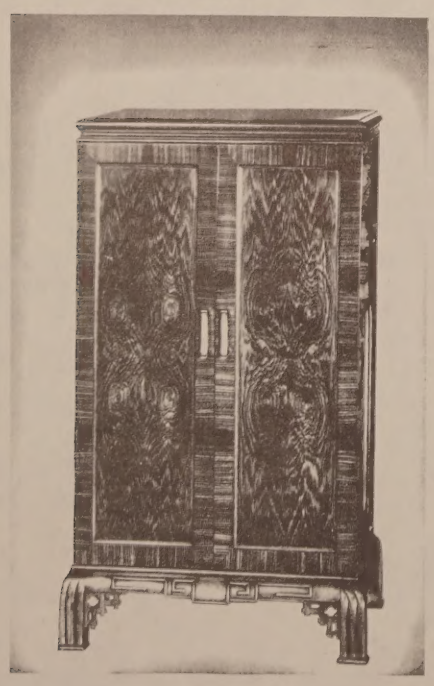
30 tube SCOTT PHILHARMONIC



The Power Amplifier for Scott Philharmonic

The Roslyn Grande

A graceful design in Chinese Moderne—front panels Crotch Honduras Mahogany, trimmed with Brazilian Rosewood.



THE New 30 Tube SCOTT PHILHARMONIC is the finest instrument known to radio engineering, with performance standards which, I believe, are not even remotely approached by any other radio receiver in the world today. Incorporated in the design of this new SCOTT are many patented developments of our Research Laboratories which are used exclusively in Scott receivers. All of the specialized knowledge gained in nearly 15 years of continual advanced research and building of hand-made, super-powerful super heterodyne receivers for scientists, musicians, and critical laymen listeners in all parts of the world, has been incorporated into this custom-built precision instrument.

The 30 Tube SCOTT PHILHARMONIC is designed primarily for those who want the finest de luxe receiving equipment that money can buy, and in the limited space below will be found a few of the many advanced and highly developed features incorporated in this amazing instrument.

• Six wavebands covering all wavelengths from 3.75 to 2,000 meters • Overall Fidelity practically flat from 30 to 16,000 cycles, approximately four times the tonal range of average production-type receiver • Built-in Distortionless Push-Pull Program Volume Range Expander, which restores the dramatic depth lacking in orchestral music when heard over the average radio or electric phonograph • Cathode Ray Volume Range Expander Indicator • Six Noise Reducing systems, operative on both electrical interference and atmospheric static • Two Tuned Band-Passed R.F. stages on five tuning bands • Four highly developed Litzendrath air tuned stages of I.F. Amplification • Automatic Needle Scratch Suppressor which eliminates annoying needle scratch from records when reproduced at low volume, without affecting the Fidelity at normal volumes • Perfected Inverse Feed-Back system which smooths out "dips" and "peaks" in loud speaker response, giving richer and more natural bass • New Automatic Noise Limiter reduces effects of automobile ignition and similar intermittent "peaked" electrical interference • Undistorted Class "A" Power Output 40 watts (60 watts peak), approximately seven times that of most production type radios • Reproduces any degree of volume from the slightest whisper to full auditorium volume without distortion or fuzziness • Continuously Variable Selectivity from 2 to 16 Kc., approximately five times the Selectivity range of most production-type radios • Continuously Variable Sensitivity from .5 microvolts to 20 microvolts (approximately six times more sensitive than the average production-type radio). Sensitivity can be instantly adjusted to exact degree required for difficult locations and reception conditions • Separate Continuously Variable Bass and Treble Controls for (1) improving Fidelity of poorly transmitted broadcasts and low-fidelity records, (2) for adjusting the tonal response of the Philharmonic to your individual ear-sensitivity, and (3) for matching the receiver to the acoustical properties of the room in which it is located • Special heavy duty 15″ High Fidelity Loud Speaker • Two Separate Automatic Gain Control systems acting on both R.F. and I.F. Amplifiers (instead of single Automatic Volume Control on I.F. Amplifier ordinarily used for control of fading signals) • Scott Super-shield Antenna Coupling system • Tone Balanced Volume Control automatically strengthens and emphasizes bass or treble overtones that usually drop out of hearing when the average radio is played at low volume • Stabilized Oscillator • New Laboratory-type Tuning Dial incorporating all the precision, legibility, and dependability found in expensive scientific meters • Dial Calibration accurate to within .2 of 1% • Two separate Tuning Speeds • Silent tuning between stations • Improved Cathode Ray Tuning Indicator • Terminals for instantly attaching record player (automatic or manual) • All exterior parts heavily chromium plated • All coils and transformers impregnated and sealed against climatic and atmospheric extremes • 30 latest type tubes used on all wavebands • Connections provided for extension speakers • 30 Day Home Trial to prove absolute superiority over any other radio receiver available today • Guaranteed Five Years against defects (except tubes) instead of the 90 day guarantee given with production-type radio receivers.

Silver Ghosts

BY J. W. F. PUETT

I am not thinking of Rolls Royce automibiles, but of those beautiful chrome-plated classic radios of the thirties. In that decade, the genuine mark of distinction in home entertainment radios was held by two manufacturers, the E. H. Scott Radio Laboratories and McMurdo Silver, Inc. These sets were truly magnificant both technically and artistically. No other radio receivers ever made were of higher quality, more elaborate, or as full of the latest innovations. Both manufacturers constantly changed their circuitry to keep up with the rapid progress of radio technology. People in all parts of the world purchased these super radios, sometimes at prices in excess of $1,000.00 for certain special consoles. Today, many radio collectors treasure these classic radios with the same esteem as automobile collectors who are fortunate enough to own such great classics as the Duesenberg, Hispano-Suiza or Locomobile. Mc Murdo Silver will be covered in a future article, for now, lets focus on the E. H. Scott Radio Laboratories.

E. H. Scott was a brilliant engineer and a very successful business man. During the second World War, he devised a means of detecting the firing of diesel engines. A few years later, observing the fast moving progress of radio, he opened his first laboratory, the Scott Transformer Company, in Chicago, Illinois with only one assistant. From this meager start in 1925, the laboratory progressed to a large three-story building with 97 employees by 1935. "The Worlds Finest Radios" were always their product, starting with a few obscure models and moving rapidly to the World's Record models 8, 9 and 10 by about 1927.

In 1930, Scott introduced the first 12-tube Allwave receiver which utilized plug in coils and a dual tuning system with separate oscillator and RF tuning. An inproved Allwave set was offered about three years later in which the coils were switched on a rotary platform under the chassis. This set featured one knob tuning. During this Allwave period, Scott challenged "the whole world of radio" to any kind of competitive test, but that challenge went unanswered. An improved 15-tube Allwave receiver was then introduced, followed by the 23-tube Full-Range High-Fidelity Receiver in later 1934.

By 1935, Scott radios were in use in 146 different countries. In 1936, the 40-tube Quaranta was placed in very limited production. The Quaranta was basically the 1936 version of the 23-tube Scott receiver with a special elaborate audio system.

The era of the giant began in 1937 and would last until the outset of the second World War. It was then that the April issue of the Scott News announced the 30-tube Scott Philharmonic. The Scott News was a monthly publication primarily for Scott owners. Also, in this time period, Scott designed a fabulous communications receiver. Although it was never manufactured, a few of these receivers were assembled in the laboratory. At least two are known to exist in collections in the United States.

In 1939, the improved Philharmonic with the beam-of-light dial was introduced. This receiver had nine controls; fine and coarse tuning, sensitivity, selectivity, bass, treble, volume, record-scratch suppressor, expander, and band switching. The Phantom and Super XII were also offered in 1939. With the start of FM broadcasting, in 1940, the 33-tube Philharmonic Combination was produced along with several lesser sets, all incorporating the then new FM band which spanned from 40 to 50 MHz.

During World War II, German submarines used direction finders to locate ships at sea up to 100 miles away by tuning in on the signal from the local oscillator in any superhetrodyne receiver aboard the ship. In only weeks, Scott designed and developed a superhet receiver which produced no detectable radiation beyond 25 feet. Thousands of these special marine receivers were used aboard naval and merchant marine ships both for communications and for crew entertainment purposes. After the war, a number of the Model SLRM marine receivers were converted and sold for custom installations under the name Export Receiver. This was probably the finest AC/DC receiver ever produced.

In the post war years, the last of the classic Scott radio receivers was the type 800B. A few less elaborate sets were produced in the early fifties, then E. H. Scott retired, the company was sold, and like that proverbial old soldier, faded away.

The Scott Philharmonic was perhaps the grandest of all classic radios. It was certainly the most elaborate. The RF line-up of this 30-tube set consisted of two RF amplifier stages, a separate mixer and local oscillator, and four IF amplifier stages.

Separate AGC amplifiers were provided for the RF and IF amplifiers. All critical circuits were supplied with regulated high voltage. The set came equipped with a two-stage record-scratch suppressor and a fantastic 7-tube volume expander. Two magic eye tubes provided tuning indication and a visual display of the operation of the volume expander. Selectivity was continuously variable from 2 to 16 KHz.

The audio amplifier was rated at 40 watts RMS with less than one percent harmonic distortion. The speaker system consisted of one fifteen-inch woofer and two separate four-inch tweeters. The audio system overall frequency response was rated 30 to 16,000 Hz.

Before being selected for use in these receivers, all tubes were aged for 24 hours, then thoroughly tested and matched. All transformers were baked in a thermostatically-controlled electric oven for 24 hours to remove all traces of moisture, then they were subjected to a special moisture-proofing treatment. After assembly and wiring, each chassis was placed in an aging rack for 24 hours of continuous operation. After aging, all final adjustments were performed in a copper-screen shielded room. Shaking tables were used to check the permanency of all adjustments. After these rigorous tests, each chassis was pronounced ready for installation in its console.

The mark of a true classic radio does not stop with the latest technology of its time or with the use of the highest quality components. The wooden consoles in which the chrome-plated tuners and amplifiers were installed were products of master craftsmen. Each cabinet was custom built by hand as were the chassies and speakers within. High-speed quantity-production methods were unheard of obscenities.

At the E. H. Scott Radio Laboratories, each piece of lumber used in console construction was first stacked in the open air where it was allowed to dry from one to three years, depending on its thickness. Following the air drying, the wood was placed in a dry kiln and steamed from 24 to 36 hours to remove all acids. After steaming, it was left in the dry kiln at a temperature of 140 to 170 degrees from three to six weeks, depending on thickness and the kind of lumber. When the moisture content was reduced to 6 to 10 percent, the lumber was placed in a cooling shed for several days. It was then placed back in the kiln where dry heat was applied until the moisture content was further reduced to four to six percent. The wood was finally given a special secret-process treatment which made it practically impervious to moisture. Only then was it ready to be built into Scott consoles by men who had devoted their lives to building fine furniture.

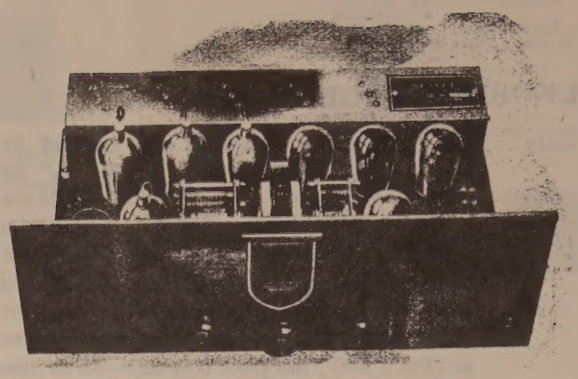
The sides and legs of Scott consoles were tongued and grooved, the tops were mitered and fastened together with wooden dowel pins, and the back, front, and sides of drawers were dovetailed. In that day, most of the cheaper-class mass-produced consoles were assembled by nailing and glueing the parts together.

The finishing process started with hand sanding followed by a coat of water stain. When the stain was perfectly dry, the entire console was again carefully sanded. After drying for several days, it was primed with three coats of pure white shellac, being carefully sanded between each coat. The cabinet was then allowed to dry for several days after which it received four coats of clear lacquer, each coat being allowed to dry throughly before the following coat was applied. After the third coat of lacquer, the console was rubbed down with a very fine pumice and oil and then thoroughly cleaned. When the fourth and final coat of lacquer was applied, it was again rubbed down with pumice and oil and given its final polishing by an expert finisher.

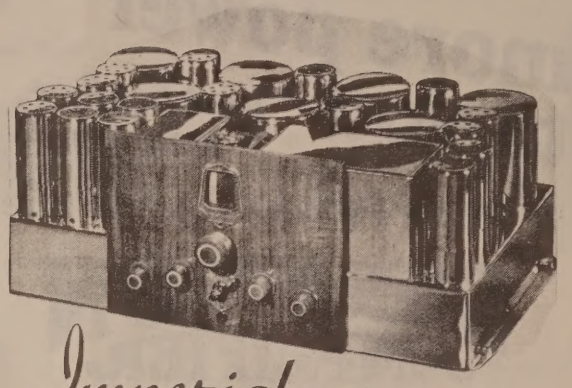
The finishing process used on ordinary consoles of that day consisted of dipping the entire unit in a bath of oil stain, after which came one coat of shellac and finally one coat of lacquer.

The list price of Scott consoles ranged as high as $1,800.00 for the Warwick Grande. This included the tuner, amplifier, speakers and an automotic record changer. With exception of tubes, every part was guaranteed for five years against defects in material or workmanship.

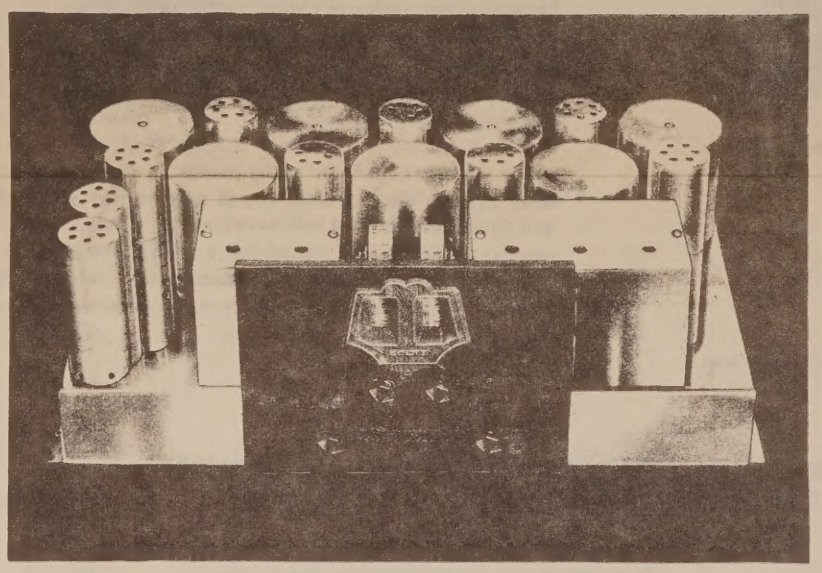
The Scott Philharmonic was indeed a futuristic radio receiver bridging almost two decades into the era of the fine high-fidelity sound systems of the nineteen fifties.



Scott A-C SHIELD-GRID 10
1931



Imperial 1935 Hi-Fidelity by Scott



ALL-WAVE
1930

TALKING MACHINE

wood ⅜″ thick and cut a block from same 1⅝ by 2″, bore with an extension bit a hole 1 3/16″ in diameter (as in Fig. 1 B¹c). This hole should not go through the block but should be bored to a depth of ⅛″, now with a ½″ bit bore through the block in the centre of the first hole, another piece the same size must now be cut out of cigar box wood and a ⅜″ hole bored in centre of same as (Fig. 1 B²c) ; this piece is to be bored for four

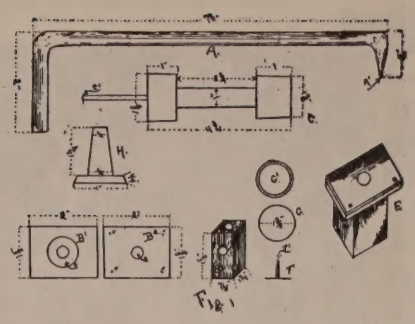


Fig 1

small screws (B²xxxx) which fastens it to B¹ Now from a sheet of mica (the thickness o writing paper) cut a circle 1 ⅜″ diameter (G) ; tx the centre of this glue a wooden post 1 by ⅛″ (F F¹), cut from some blotting paper two rings (as in G¹), lay one of the rings over the hole C in B¹, lay the mica on this and place the other ring over the mica, then screw the block (B²) over this and you have the diaphragm completed. From a piece of hard wood cut a block 1⅝″ by 1¼″ by ⅞″ (D), in the end of this bore a ½″ hole to the depth of 1⅛″, then bore a ⅜″ hole in the side of the block to meet this and fasten to diaphragm (Fig. 1 as E).

Next procure a piece of ¼″ glass tubing and bend (by heating in a flame) as in A ; the point A¹ should be drawn out as small as possible and smoothed off by holding in the flame until it melts and runs together ; this forms the reproducing stylus. Get a piece of wood turned as C and through the centre of this drive a steel rod c¹ ⅛″ diameter ; this should extend 2″ out of one end and come flush at the other. Make two standards (as in H) and bore holes for shaft ½ from top of same, these can be made of wood or brass, if made of wood the bearings should be bushed to prevent wear. They should now be mounted on base (Fig. 2. BB) and the cylinder or mandrel (C) set in place. The machine may be operated by hand power, spring or electric motor, or it may be mounted on a sewing machine top and be run by foot power. The writer gives a description of a friction governor which must be used if operated by hand or foot power (see Fig. 3). A is a ⅛″ shaft, B and B are pivot bearings to support same, a pulley (1) should be fastened by means of a set screw (a). A piece of brass (2) is next turned and fit to the shaft so it will move free on same ; another piece (3) is turned for a pulley, two pieces of spring steel (6—6) are fastened from 2 to 3 with small screws and to the centre of each

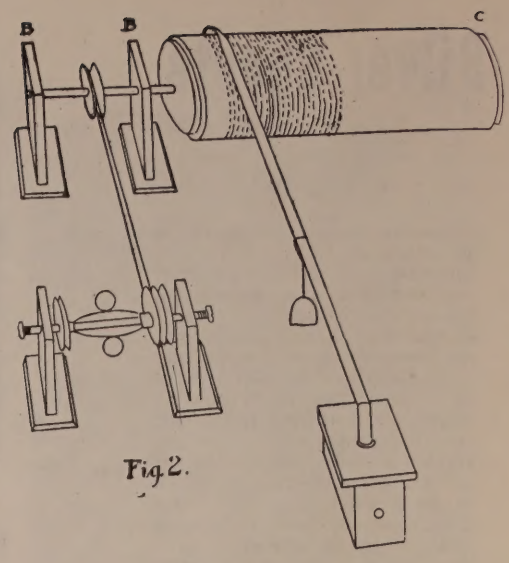


Fig 2.

spring fasten a metal ball ½″ diameter, the pulley (3) is fastened to shaft and is belted to driving wheel of sewing machine or hand power ; the pulley (1) is also turned of brass and belted to machine. The machine should run about 120 revolutions per minute, and by moving pulley (1) on governor backwards or forwards on shaft this speed may be obtained. Fig. 2 shows machine completed. A small weight should be suspended from the glass tube (A), this will cause the stylus to follow the thread or groove on record. Procure an ear tube, which may be purchased from any Phonograph supply house at a low price, and insert the end of same in the hole Fig. 1 Ea, slip

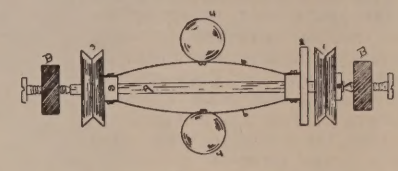


Fig 3

the wax record (also obtainable at the Phonograph supply house) on the mandrel (C) (Fig. 1) and set the glass stylus in the thread or groove at pulley end of mandrel, place the ends of tubes in the ears and start the machine. Should the reproductions not be clear remove the mica in diaphragm and substitute a thinner piece. Care should be taken that the governor balls (Fig. 3, 4—4) and springs are of the same weight, as a difference in the weight of balls or of the tension in the springs would cause the governor to vibrate

more power to you ~ and perfect tone too!

If you attach to your set the

SONATRON AMPLIFIER

WITH

(3) Red White & Blue Matched Tubes

For use with Dry Cell & Storage Battery Sets

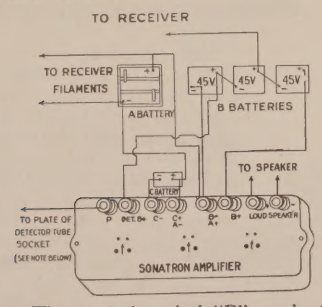
Product of

SONATRON TUBE CO.

CHICAGO NEW YORK NEWARK DETROIT

WINDSOR, ONT., CANADA

FOLLOWING DIAGRAM SHOWS SONATRON AMPLIFIER CONNECTED TO BATTERIES AND SET



NOTE: The terminal marked "P" on the SONATRON AMPLIFIER is connected to the detector plate on all sets but the regenerative, in which set it is connected to the end of the tickler coil as shown in the regenerative diagram.

ADDITIONAL INSTRUCTIONS

1. CAUTION: Connect the "B—" Battery to the Receiver "B—" terminal only, or to the Amplifier "B—" terminal only. Connecting both may cause a short circuit.

2. Use 90-volts "B" for "Det. B+" terminal and 135 volts for "B+." Ninety volts can be used for both terminals, but greater Amplification results if 135 volts are used on "B+."

3. Be certain to disconnect "Det. B+" Battery going to your set. Note the "Det. B+" Battery is furnished through the SONATRON AMPLIFIER, and if Detector "B" voltage is applied to the set, distortion will be caused.

4. It is imperative to use "C" battery as specified on circulars contained with each tube for Mu-X-6 and Mu-X-9 tubes only, for the following reasons:

First: A reduction in "B" Battery current consumption will be effected.

Second: With "C" applied, tube functions normally and greater clarity of tone results.

Third: Using "C" Battery lengthens the life of tube because it is not being strained or overloaded.

To reduce the volume, do not turn down the detector filament, but reduce the energy input to the SONATRON AMPLIFIER by reducing the output of the tuner. This may be accomplished by reducing the number of turns in the antenna circuit, or by changing the setting of the variocoupler if the latter is used. Reducing the detector filament usually produces distortion unless the change is quite small.

INSTRUCTIONS FOR CONNECTING SONATRON AMPLIFIER FOR USE AS A POWER UNIT.

Follow regular instructions for hooking up SONATRON AMPLIFIER as described heretofore with three exceptions:

First: Do not disconnect Detector "B+" battery from the set, permitting the detector plate voltage to be supplied in the regular way.

Second: Disconnect in your set the wire that runs from the plate of the first stage audio frequency socket from the rest of the set.

Third: Instead of running connection "P" to plate of detector tube, connect it to the plate of the first audio frequency amplifier tube.

NOTE: As described in last paragraph connection "P" runs to the same place where connection is broken.

Approximately 90 to 135 volts should be applied to the Detector "B+" terminal on the Sonatron unit when this unit is being used as a power amplifier. This voltage is necessary to feed the first audio frequency tube.

In order to simplify using the SONATRON AMPLIFIER as a power unit, and eliminate necessity of second and third changes as stated above, the Sonatron Company have devised a tube known as the Mu-X-201A Amplifier. List price $2.50. By using this tube in place of your first audio frequency tube, it is not necessary to open the circuit in your set. Just run your "P" wire to the binding post on this special tube, and merely connect all other connections in the regular way to your batteries and loud speaker. Only change (first above) is apply Det. "B+" battery on set. This tube is so constructed that the current running into the set which is applied to the first audio frequency tube is broken automatically.

The purpose of disconnecting plate wire is to prevent the audio frequency "B+" current from being applied on this first audio tube, which purpose this special tube serves, in addition to giving connection going to post "P."

Distortion in amplified signals usually may be traced to the loud speaker. Avoid placing the loud speaker too close to the set, since mechanical vibration of the tubes may produce a steady hum in the loud speaker.

This Amplifier, when attached to any set, will give the tone quality that is only obtainable from the highest priced sets. You can make your set, regardless of its cost, produce tone quality equivalent to that of a $2,000.00 set.

DIRECTIONS

HOW TO USE THE SONATRON RESISTANCE AMPLIFIER UNIT AND RED, WHITE AND BLUE TUBES.

READ CAREFULLY

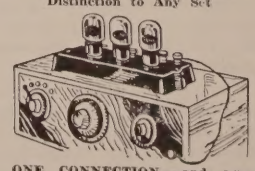
The SONATRON AMPLIFIER may be connected to any type of radio set, thereby resulting in improved quality of tone and reception. If desired, the unit can be made an integral part of the set, by replacing the audio transformers with the Sonatron Resistance Amplifier. On the other hand, the Sonatron Amplifier may be connected outside the radio set, by removing the tubes from the audio transformer sockets and connecting the Amplifier as shown in the respective diagrams.

The same "A" and "B" batteries can be used to supply current to both the Receiver and Amplifier.

The Sonatron Red, White and Blue series of tubes are made to operate direct from a 6-volt "A" battery with 201a sets, and on a 4 to 4½-volt "A" battery direct with 199 sets. These tubes are especially designed for and matched to operate most efficiently in the SONATRON RESISTANCE AMPLIFIER. Instructions for the use of the Red, White and Blue series of tubes will be found enclosed with each tube.

If the reader will note in the diagram below, there are 8 posts on the SONATRON AMPLIFIER. Beginning from the left there is post "P," this is the only connection going to the inside of set. The following 5 posts go to batteries and the last two go to loud speaker.

Attractive! Adds Beauty and Distinction to Any Set

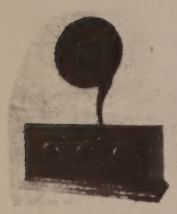


ONE CONNECTION — and one minute — that's all the SONATRON AMPLIFIER needs to transform your set—no matter how old and lacking in power—into a world-beater for distance and a marvel for tone.

Therefore, the only connection that the layman could be uncertain of is where to run a wire from "P." Note on diagrams of hookups, with the exception of the regenerative set, all connections from "P" go to detector plate. To remove all possibility of a mistaken connection to detector plate, the Sonatron Tube Company have designed special tubes both of 201A type and 200A type, which have a binding post moulded on base of tube.

All that is necessary is to run connection "P" to this binding post. List price on these tubes known respectively as Special 201A is $2.50, and Special 200A is $5.00. The tubes have same characteristics and function the same as the 201A and 200A. (To replace detector tube in set.)

TRADE NAME: "Mohawk."
MODEL: XLI.
TYPE: Uni-control built-in loud speaker.
TUBES: Five.
BATTERIES: "A" and "B" needed.
CONTROLS: One.
AERIAL: Inside or outside.
PRICE: $300.00 without accessories.
MANUFACTURER'S NAME: Mohawk Electric Corporation.



TRADE NAME: "Murdock."
TYPE: Neutrodyne with built-in loud speaker.
TUBES: Five.
BATTERIES: "A" and "B" needed.
CONTROLS: Three.
AERIAL: Inside or outside.
PRICE: $100.00 without accessories.
MANUFACTURER'S NAME: Wm. J. Murdock Company.

TRADE NAME: "National Country Gentleman."
MODEL: Portable.
TYPE: One-stage tuned radio, detector and two audio.
TUBES: Four.
BATTERIES: None furnished.
CONTROLS: Two.
AERIAL: Outside or inside.
PRICE: $80.00 without accessories.
MANUFACTURER'S NAME: National Radio Manufacturing Company.

TRADE NAME: "Neutrodyne Phonograph Radio Panel."
MODEL: P-11-215.
TYPE: For Victor Console No. 215.
TUBES: Five.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Indoor or outdoor.
PRICE: $115.00 without accessories.
MANUFACTURER'S NAME: R. E. Thompson Mfg. Co.
NOTE: For Victor Consoles No. 400, 405 and 410, the price is $125.

TRADE NAME: "Nyaccoflex."
MODEL: R-2.
TYPE: Reflex with crystal detector.
TUBES: Two.
BATTERIES: Not furnished.
CONTROLS: Two.
AERIAL: Indoor or outdoor.
PRICE: $32.50 without accessories.
MANUFACTURER'S NAME: New York Album and Card Co.

TRADE NAME: "Nyaccoflex Portable."
MODEL: RP-1.
TYPE: Reflex. In same case with phonograph.
TUBES: Two.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Indoor or outdoor.
PRICE: $55.00 without accessories.
MANUFACTURER'S NAME: New York Album and Card Co.

TRADE NAME: "Ozm."
MODEL—7 Day Fan.
TYPE: Two radio frequency, detector and two audio; reflex.
TUBES: Four.
BATTERIES: "A" and "B" needed.
CONTROLS: Four.
AERIAL: Inside or outside.
PRICE: $98.00 without accessories.
MANUFACTURER'S NAME: Dayton Fan and Motor Company.

TRADE NAME: "Parlor Grand."
MODEL: S-6.
TYPE: Neutrodyne.
TUBES: Five.
BATTERIES: Not furnished.
CONTROLS: Three.
AERIAL: Indoor or outdoor.
PRICE: $145.00 without accessories.
MANUFACTURER'S NAME: R. E. Thompson Mfg. Co.

TRADE NAME: "Peak of Perfection."
TYPE: Super-reflex with built-in loud speaker.
TUBES: Four 199 type.
BATTERIES: Dry cell "A" and "B."
CONTROLS: Three.
AERIAL: Outside.
PRICE: $124.00 without accessories.
MANUFACTURER'S NAME: Parkin Mfg. Company.

TRADE NAME: "Pliodyne."
MODEL: 6.
TYPE: Two stages tuned radio frequency, detector and three stages of audio frequency amplification.
TUBES: Six.
BATTERIES: "A," "B" and "C" needed.
CONTROLS: Three.
AERIAL: Outdoor, indoor.
PRICE: $60.00 without accessories.
MANUFACTURER'S NAME: Golden-Leutz, Inc.

TRADE NAME: Pocket Radio.
MODEL: Standard B.
TYPE: Non-regenerative.
TUBES: One UV-199.
BATTERIES: Dry cells.
CONTROLS: One.
AERIAL: Indoor and outdoor.
PRICE: $23.50 without accessories.
MANUFACTURER'S NAME: Auto Indicator Co.

TRADE NAME: "Portola."
TYPE: Two radio, detector and two audio with built-in loud speaker and loop antenna.
TUBES: Six 199 type.
BATTERIES: Dry cell "A" and "B."
CONTROLS: Two.
AERIAL: Built-in loop.
PRICE: $160.00 without accessories.
MANUFACTURER'S NAME: Portola Radio Company.

and by so doing spoil the effect of the reproductions. The machine should be run to the right (when facing same). Any person of ordinary intelligence can with a few tools make the machine and if constructed according to the directions given, good results will be obtained. The writer has in practical use a machine of this kind and the softness of tone obtained from same is surprising. In fact better quality is given than is found in the cheap machines on the market at the present time. A large funnel shaped horn or amplifier may be used in connection with this instrument by merely connecting same by means of a short piece of rubber tubing to the diaphragm. This makes it possible to entertain a large room full of people at once.

Why the Sonatron Amplifier Is Better

14 POINTS OF SUPERIORITY

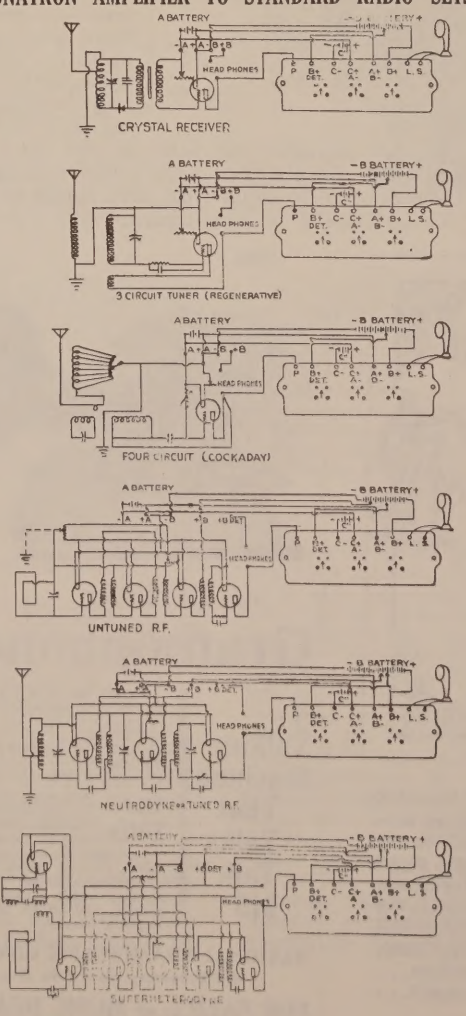
1. Genuine polished bakelite base, insuring perfect insulation, and long life.
2. All working parts concealed in the base, preventing them from damage.
3. Perfect contact between springs and tube prongs due to special double action contact design.
4. No unnecessary exposed parts, thereby preventing short circuit and tube burn-outs.
5. Permanent soldered connections, insuring long life and freedom from noises.
6. All parts heavily nickel-plated, preventing corrosion.
7. Wiring reduced to a minimum, insuring maximum volume.
8. Resistances housed in special composition tubing, insuring permanent resistance reading.
9. Condensers made of rigid indestructible construction.
10. Mounting holes permit unit to be fastened in any position.
11. Binding post tops cannot come off.
12. All terminal lettering permanently moulded in bakelite.
13. Tubes can only go in the correct way, eliminating danger of burn-out.
14. Extremely good appearance.

The Sonatron Amplifier is the ***Only*** Resistance Coupled Amplifier produced to-day that is equipped with a switch or a Mu 30 tube. This tube amplifies signals at a ratio of 30 to 1—A most remarkable achievement in the manufacture of radio tubes.

"DRY CELL SETS"

The Sonatron dry cell unit is very highly recommended to owners of dry cell sets, due to the fact that much greater power results in using Hi-Mu tubes. It is a matter of common knowledge that resistance coupled amplification depends on the amplification constant, or the Mu of the tube. The amplification constant of our Mu-29 and 19 average about 20. This high amplification constant gives users of dry cell sets the opportunity of securing volume regularly obtainable on storage battery sets only. In addition to greater volume, remarkable tone quality common to this means of amplification will also result. We highly recommend the use of this unit for dry cell sets.

THESE DIAGRAMS SHOW HOW TO CONNECT SONATRON AMPLIFIER TO STANDARD RADIO SETS



SONATRONIZE YOUR SET!

The most amazing of all radio improvements—the SONATRON AMPLIFIER! Any set is worth four to five times its cost with Sonatron's famous Red, White and Blue power tubes—perfectly matched—on the job. Flawless tone, clear, strong and melodious; a world of power to bring in the distant stations with real volume, and absolutely no trace of distortion! Sonatron adds three stages of amplification to any set, whether it has one tube or ten—and the results are making the greatest news in radio history.

SONATRON AMPLIFIERS are neatly packed and sold in this box—look for it. It identifies the genuine Red, White and Blue SONATRON MATCHED POWER TUBE AMPLIFIER.

The purity of tone of a $2,000.00 set is yours if you attach the SONATRON AMPLIFIER to your set.

Use of this Amplifier doubles the life of "B" batteries.

The Sonatron Mu-X-30-20 and 6 6-volt tubes and the Sonatron Mu-X-29-19 and 9 4-volt tubes consume less than ½ the "B" battery current of the 201A and 199 tubes which they replace.

Individual set builders and set manufacturers may eliminate all worries about hooking up the audio frequency end of the set, by using the SONATRON AMPLIFIER as the audio end.

The SONATRON AMPLIFIER is equipped with a switch for turning filament off and on. A one-year guarantee by the Sonatron Tube Company stands behind the SONATRON AMPLIFIER.

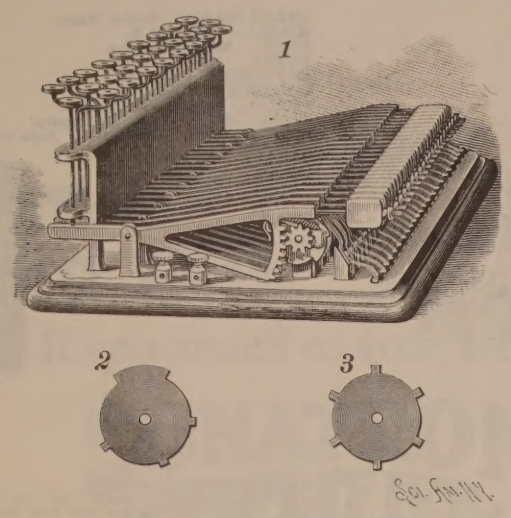
List price of SONATRON AMPLIFIER complete with three (3) Red, White and Blue Tubes is $20.00.

SONATRON AMPLIFIER

PRINTED IN U. S. A. FORM 1217

AN EASILY OPERATED TELEGRAPH INSTRUMENT.

The illustration represents an instrument designed to facilitate the transmission of telegraphic messages with speed and accuracy. It has been patented by Dr. Samuel W. Smith, of No. 24 West Thirtieth Street, New York City. Aligning vertical supports on a suitable base carry horizontal shafts on which are disks having projections varying in length, and adapted by means of varying contact with the trailer to transmit dots and dashes. The disk used in sending one of the longer characters is shown in Fig. 2, which represents a "v" in the Morse alphabet, requiring a dash and three dots, Fig. 3 showing a disk used in sending one of the shorter characters, as the letter "e," which would be represented by a dot. Fixed on each disk-carrying shaft is a ratchet wheel, adjacent to which is a pinion



SMITH'S TELEGRAPH TRANSMITTER.

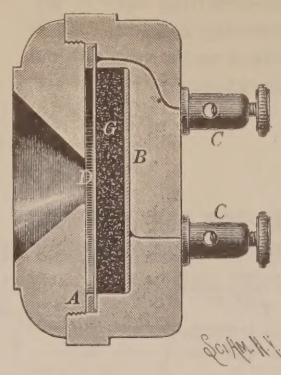
carrying a spring-pressed pawl, with other mechanism, the arrangement being such that the character disks may be given a whole revolution or any part of a revolution by each movement of the key, the motion being limited and regulated by the mechanism. Each key rests on an outer projecting end of a carriage pivoted between vertical supports, there being near the opposite end of the carriage a segmental rack meshing with the pinion on a disk-carrying shaft, the carriage also having a projecting screw-threaded portion carrying a weight adjustable by means of a nut. Each key is marked with a letter corresponding with the projections on one of the disks, and any person who can read the letters can operate the transmitter, it being only necessary to depress a key to transmit a letter. The movement of the sending mechanism is regulated by the downward movements of the weights, whereby the motion of the character disks is made steady, and accuracy and rapidity are assured. Each key and its mechanism works independently, forming a transmitter in itself. This instrument may be adapted to any code of signals.

SCIENTIFIC AMERICAN, January 10, 1891

TELEPHONE

LONG DISTANCE TELEPHONY.

The difference between the ordinary and the long distance telephone systems lies not so much in the instruments used for transmitting and receiving speech as in the lines. The fundamental thing in the long distance telephone is a metallic circuit, *i. e.*, a line in which the current returns through a wire instead of the ground. Another important difference is that the wire used in the construction of the line is of very high conductivity. By the employment of the metallic circuit the effects of induction are *nil;* the induction in both wires being equal and in opposite directions in the receiving instrument, exactly neutralize each other.



Where the long distance line is in a cable containing other lines, the two wires are usually twisted, to subject them both to exactly the same inductive influence.

These are important points, and it is of course necessary to employ an efficient transmitter. The one commonly used on long distance telephone circuits is known as the "Hunning transmitter," shown in section in annexed engraving, for which we are indebted to Prescott's "Electric Telephone." The diaphragm cell is made of insulating material, and arranged to clamp a diaphragm, D, of thin platinum foil or ferrotype plate, the diaphragm being held in place in the cell by a ring, A. In the cell is arranged a back plate, B, of brass, the space intervening between the back plate, B, and the diaphragm, D, being filled with a body, G, of loose, finely divided conducting material, preferably finely granulated coke, sifted so as to remove all fine dust. Oven-made engine coke is recommended for this purpose. The binding screws, C, C, are placed in connection with the diaphragm, D, and back plate, B.

This transmitter may be used in a circuit with a battery and Bell receiver, or the transmitter and battery may be arranged in circuit with the primary wire of an induction coil, the secondary wire being connected with the line wires extending to a distant point, and there provided with a Bell receiver. This transmitter has been tested by Prof. Cross along with the Edison and Blake transmitters, with the following results: The average strength of the current flowing with the Edison transmitter was 0·100 milliampere; with the Blake transmitter, 0·138 milliampere; and with the Hunning transmitter, 0·560 milliampere.

SCIENTIFIC AMERICAN, January 24, 1891

PARAGON DESIGNER DIES

Paul Godley, who helped produce the famous Paragon receivers in the early 20's, a favorite with collectors, died recently at the age of 84.

CINCINNATI MUSEUM

Jack Gray's Antique Wireless Museum will be included in the new studio building of WCET educational TV station in Cincinnati. The new building is scheduled to be completed in December 1975.

ARCA SECRETARY-TREASURER

Joseph Horvath is the new secretary-treasurer for the Antique Radio Club of America. He lives in the area of ardent collectors at the address of 522 Third Street, San Rafael, California 94901. He is the one from whom to request membership information.

ANTIQUE WIRELESS ASSOCIATION, 1973 RECEIVER CONTEST

WINNERS - 1973 CONFERENCE

CLASS I Regenerative Receivers
--1st Ralph Muchow (DeForest Regen.)
--2nd Larry Whitlock (Marconiphone V2)
--3rd John O'Bannon (Zenith 4R)

CLASS II TRF Receivers
--1st John Johnson (Silver Ghost)
--2nd Jim McBurney (A-K Radiodyne 12)
--3rd Bill Lighfoot (Freshman Master.)

CLASS III Superhets
--1st John Caperton (E I Leutz)
--2nd Alfred Sayer (Nine-in-Line)

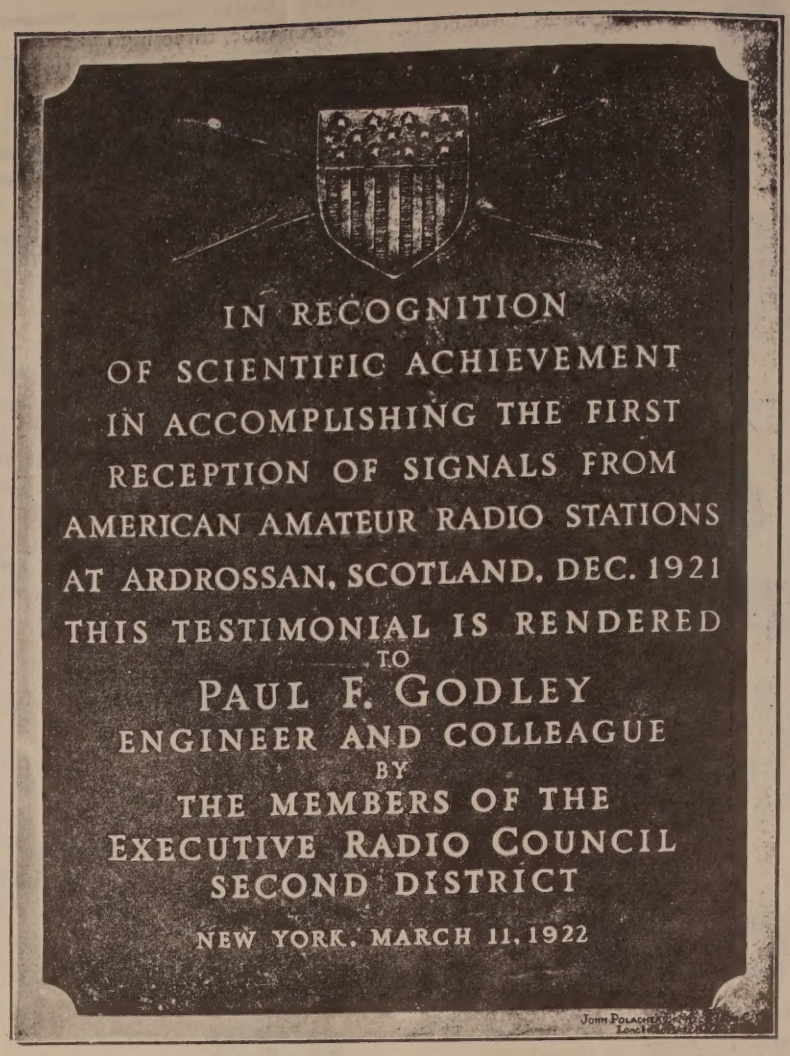
CLASS IV DeForest Commercial Equipment
--1st Ed Raser (Syntonizer and Detector)
--2nd Rod Melhuish (CF-99 Transmitter)
--3rd John Caperton (15 panel receiver)

CLASS V DeForest home BC equipment
--1st Lauren Peckham (Everyhome & Amp.)
--2nd Ralph Muchow (D-9)
--3rd Floyd Bennett (Everyman)

CLASS VI DeForest equipment
--1st Stu Davis (DeForest Audion rcvr.)
--2nd Lauren Peckham (Oscillion Lab. Osc.)
--3rd Ralph Muchow (Audio Amp. M200)

JUDGES:
Mel Comer (Pennsylvania)
Russell Hanselman (Illinois)
Paul Giganti (California)
Ralph Williams (Pennsylvania)

OLD TIMERS BULLETIN

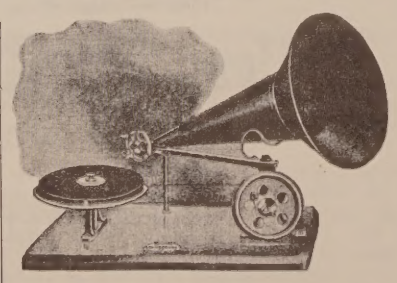


Testimonial Rendered to Paul F. Godley in Spring of 1922. In Scotland Mr. Godley Used a Super-Heterodyne of His Own Design and Manufacture.
MODERN RADIO RECEPTION
C. R. Leutz

This Room Is Equipped With
Edison Electric Light.
Do not attempt to light with match. Simply turn key on wall by the door.
The use of Electricity for lighting is in no way harmful to health, nor does it affect the soundness of sleep.

Now you can have an exact 1890 EDISON ELECTRIC LIGHT PLAQUE REPLICA as used when electric lights were first installed anywhere. . .You can MOUNT and DISPLAY this PLAQUE on any SURFACE because of its ADHESIVE BACK. . .just remove paper from back and mount as desired. . .All design and lettering are ENGRAVED and seated in black. . .A special process added to the GOLD-IN-COLOR Aluminum plate makes it impossible to CORRODE or OXIDIZE. . .Unlimited uses and ideas in the Antique field, makes an EYE-CATCHING DISPLAY, HUMOROUS, but serious. . . A fine gift for any occasion. . . ORDER NOW, ONLY $4.95 Postpaid. . . MIDCO HS10 BOX 15370, LONG BEACH, CA 90815.

1896



The Berliner Gramophone

A Talking Machine That "Talks Talk" $15

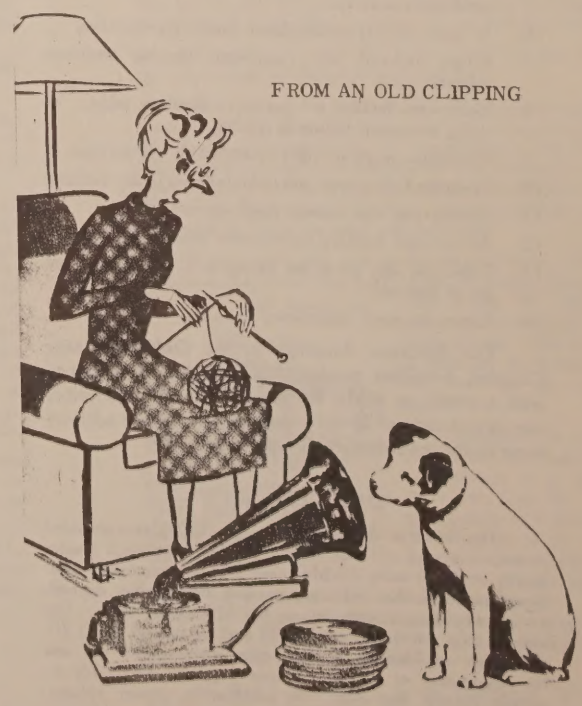
At last we have produced a talking machine second to none in its powers, one that anybody can manage. With it one can give most amusing and varied entertainments and have the greatest novelty in town.

Our Offer: We shall be pleased to give the fullest information on request, and for a limited time offer to send this talking machine to any LADIES' HOME JOURNAL subscriber with privilege of returning within 3 days after its receipt, and refund money less express charges.

NATIONAL GRAMOPHONE COMPANY
874 Broadway, New York City

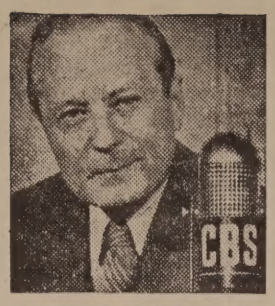
FOR SALE by all MUSIC DEALERS

FROM AN OLD CLIPPING



"Why don't you go out and chase cats— the way other dogs do!"

Radio



6:45 PM MR. KEEN Tracer of lost persons, Mr. Keen dramatically reunites loved ones. Three times weekly.

7:30 PM DOCTOR CHRISTIAN A country doctor in a typical American town, Jean Hersholt.

8:30 PM THAT BREWSTER BOY Peck's Bad Boy had nothing on Joey. He's a laugh-riot!

8:30 PM JACK CARSON Something new in comics, in something new in comedy programs!

8:00 PM PLAYHOUSE Johnny presents adaptation of popular movies and plays.

9:00 PM GREAT MOMENTS IN MUSIC presents the rich voice of lovely Jean Tennyson.

?:15 PM MEET THE MISSUS All-out hair-down fun. A laugh a minute.

8:45 PM SATURDAY NIGHT SERENADE Good music by famous Jessica Dragonette.

LETTERS

EDITOR'S MAILBAG

Gentlemen:

I write you at the suggestion of the Consumer Relations Administrator of RCA.

I had written them in an effort to secure a schematic diagram for a Radiola 25 SuperHet battery radio set.

My interest was in finding someone to build or supply an adapter which would permit me to operate this set from conventional 110 v ac supply.

Perhaps you would send me a sample copy of the publication which you put out for dealers and collectors?

Will appreciate any help you can offer.

Sincerely,
David R. Turnbull
1957 Highland Drive
State College, Pa.
16801

EDITOR: Write to one of the power supply builders in our ads.

Dear J. C.-

Your paper is great. My field is phonos and record collecting but I came across a Philco cathedral table model radio the other day I had to buy. You showed on page 2 of the Sept. issue a reproductive of an Edison Reminder sheet. I would like one of these framed to hang near one of my machines. Why don't you have some printed up? They should sell well. If not do you have any from your tear sheets for sale. I would like two.

I once saw a small Toll Rate card attached to an old wall telephone. Sure would like one of these for mine if someone would issue them.

Best wishes,
H. Custer
30635 Helmandale Dr.
Franklin, Mich. 48025

EDITOR: Good ideas.

Gentlemen:

I have an old Victrola (Victor Talking Machine), Model VV-IX-Ser. No. 296588G.

This machine is in need of repair—particularly the cabinetry. I'm told that you have available some plans, sketches, etc., which will assist me in repairing this machine.

Your advice will be most appreciated.

Cordially,
B. Fremerman
4041 Central
Kansas City, Mo.
64111

EDITOR: We printed this letter to help Mr. Fremerman and those who offer services.

Dear Mr. Cranshaw:

I enjoyed the short article on page 7 of your November 1973 issue about the Baird Televisor but would like to know more about it. I would especially like to know how they were able to regulate the speed of the scanner and make it "lock in" by putting the synchronization information on the radio signal. How about some more information on this fascinating device in another issue.

Sincerely yours,
John D. Martin
R. R. 5 Box 17
Quincy, Ill. 62301

EDITOR: We are working on it.

MART

EASY COST CHART

FOR CLASSIFIED ADS

No. Words	One Issue	Two Issues	Three Issues	Twelve Issues
1-25	1.35	2.45	3.45	12.75
26-30	1.70	2.90	4.15	15.30
31-35	1.95	3.40	4.80	17.80
36-40	2.25	3.90	5.50	20.35
41-45	2.50	4.40	6.15	22.95
46-50	2.75	4.80	6.85	25.45
51-55	3.05	5.30	7.55	28.00
56-60	3.30	5.80	8.25	30.55
61-65	3.65	6.30	8.95	33.05
66-70	3.90	6.75	9.65	35.60
71-75	4.15	7.25	10.30	38.20
76-80	4.45	7.75	11.00	40.75
81-85	4.70	8.20	11.70	43.25
86-90	5.00	8.70	12.35	45.80
91-95	5.25	9.20	13.05	48.40
96-100	5.50	9.65	13.75	50.90
101-110	6.05	10.65	15.15	56.00
111-120	6.60	11.55	16.50	61.00
121-130	7.20	12.55	17.85	66.20
131-140	7.75	13.50	19.25	71.25
141-150	8.25	14.45	20.65	76.30

5c per word per issue over 150 words

Photo ads $2.00 extra.

NOTE'S

MISC.

PROFESSIONAL CW operators, retired or active, commercial, Military, Gov't, police, etc., invited to join Society of Wireless Pioneers, W7GAQ/6, Box 530, Santa Rosa, CA 95402.

THE DIRECTORY of Antique Radio Collectors is now available. Write to: James Fred, R. 1, Cutler, Ind. 46920 for details.

SCOTT and McMurdo Silver radio lovers are welcome to contact J. W. F. Puett at 3008 Abston Dr., Mesquite, TX 75149

FOR SALE OR TRADE

FIVE EDISON Cylinder Records for $30.00. Turkey Straw; Hi Si Jatawn; Uncles Farm; Preacher Bear; Lonesome Pine. Four minutes. Charles Seidel. 767 Westwood, Santa Barbara CA 93109.

HAVE GOOD Stock new 7 and 14 volt loctal tubes $3.00 each. William L. Poston, 3212 Peachtree Ct. Bakersfield CA 93301.

NEW 1973 MIDCO'S RADIOS/WIRELESS ANTIQUERS DIRECTORY & COLLECTORS GUIDE, 4th Edition, OVER 650 Names/Addresses, Phone Numbers, Call Letters, Data of Traders, Buyers, Sellers, Clubs, Museums in U. S. A. & Canada, Associations, Collections, Societies, Old Radio Reprints, Jokes, Collecting Hints for Both the Beginner or Advanced Collector. SERVICES OFFERED: Antique R/W Appraising, Advertising, Restoring, Repairing, Publications, and related subjects. ONLY one Known, EXPERTS in this hobby Keep Directory at Their Finger-tips. ORDER $5.00 PP. , MIDCO HS10, Box 15370, Long Beach CA 90815.

SELL OR TRADE: Three Old Cathedral style radios in working condition--- vintage of early 30's. Will trade for Radiola III or IIIA parts, also am interested in old battery radios. Howard Gramoff, 2445 Lyttonsville RD. Silver Spring, Md. 20910.

WD11 Adaptors, use UX199, 120, VT24. No Wiring changes, Radiola III's Battery hook up included $5.25 pp., 2 for $9.25. Keith Parry, 17557 Horace St., Granada Hills CA 91344.

FOR SALE: Power supplies for battery-operated radios, standard and custom. WANTED: Colin B. Kennedy Model 281. G. B. Schneider, 6848 Commonwealth Blvd., Parma Hgts., Ohio 44130.

LARGE STOCK Ballast Tubes, Hytron, Muter, Clarostat, J. F. D., Amperite etc. Specify Ballast number, $3.00 each prepaid. William L. Poston, 3212 Peachtree Ct., Bakersfield, CA 93301.

1921-1931 schematics and service data where available $2.00. Cecil Bounds, Pine Springs Rte., Carlsbad, N. M. 88220.

FEW HUNDRED Old Radio tubes. SASE for list. Frank Oglesbee, 900 E. Park No. 17, Carbondale Ill. 62901.

ANTIQUE TELEVISIONS from 1930's - 1940's, 35 different Models, sell one or all send $1.00 for Picture List. Charles Seidel, 767 Westwood, Santa Barbara CA 93109. (805) 962 3620.

VICTOR TRADEMARK Brass Belt Buckles, $10.00 each. Postpaid. Three for $25.00 Ppd. Dave Martens, 7 Constitution Blvd., New Castle, Delaware 19720.

WANTED

WANTED: AK instruction books, Volumes 2 and 4. I'm also interested in other manuals and literature. Can supply copys of schematics from Rider 1 and a few others for 50¢ each plus large SASE. Alvin Heckard, Rd 1, Box 88, Lewistown, PA 17044.

EARLY DATE RADIO TEST EQUIPMENT WANTED. SUPREME, WESTON, JEWEL, ETC. WITH INSTRUCTION MANUAL. GIVE COMPLETE DESCRIPTION, MODEL NUMBER AND PRICE. William L. Poston, 3212 Peachtree Ct., Bakersfield CA 93301.

WANT ATWATER KENTS ANY MODEL FROM 7 THROUGH 42: CROSLEYS ANY BATTERY MODEL AND GEMBOX AND SIMULAR ELECTRICS: ATWATER KENT SPEAKERS: ANY TYPE HORN SPEAKERS: WD11, 01A, 201A, ETC. TUBES. DESCRIBE & PRICE. YOUNG, 11 WILLOW COURT, TOTOWA, N. J. 07512.

GHIRARDI TROUBLESHOOTERS Handbook 1934 and 1935 issues. Early RCA or other tube Manuels. William L. Poston, 3212 Peachtree Ct., Bakersfield CA 93301.

OLD MICROPHONES, 1920 to 1940. Also Microphone catalogs and specification sheets. Bob Paquette, 443 N. 31 St., Milw., Wis. 53208.

WANTED 01A and 45 tubes. New or good used, any quantity. William L. Poston, 3212 Peachtree Ct., Bakersfield CA 93301.

puett electronics

TUBE PRICE LIST NO. 8 ----- OLDER TYPE NUMBERS
Tube prices stated in this list supersede prices stated in Lists No. 1 through No. 7.

Make all checks or money orders payable to J.W.F. Puett 3008 Abston Drive Mesquite, Texas 75149

ALL TUBES ARE THOROUGHLY TESTED on a mutual conductance tube checker before shipment.
CUSTOMER SATISFACTION GUARANTEED -- If you are not satisfied with your order for any reason, tubes may be returned within ten days for refund or replacement with exception of tubes which are shorted or have open filaments. It will be assumed that returned tubes with shorts or open filaments were damaged in shipment. Shipping damage claims will be handled promptly through the post office on insured orders. Puett Electronics assumes no liability for orders which are not insured. Tubes are mailed parcel post - no C.O.D. please. INCLUDE 10% FOR POSTAGE & HANDLING. Insurance rates are 30¢ for orders under $50.00. TEXAS RESIDENTS ADD 5% STATE SALES TAX.

In the following table, the symbol n after a tube type-number indicates that tube is available new. The symbol u indicates that it is available used. Both new and used tubes are shipped in individual cartons. New tubes are usually furnished in their manufacturers original cartons; however, new tubes are sometimes purchased in boxes which contain 50 or more tubes. These tubes never had individual cartons. We supply cartons which are not original with tubes of this type. With orders for new tubes, please let us know if only original cartons are acceptable. PLEASE STATE WHETHER NEW OR USED TUBES ARE DESIRED AND WHETHER A REDUCED-PRICE USED TUBE IS DESIRED WHEN A NEW TUBE IS OUT OF STOCK. REFUNDS are mailed with your order for out-of-stock tubes, or when, by customer request, a reduced-price used tube is substituted for an out-of-stock new tube.
NEW TUBES ARE PRICED AT $2.00 EACH; USED TUBES ARE PRICED AT $1.00 EACH.

0 u	1LD5 u	5T4 nu	6B6 nu	6L5 nu	6T8 nu	7E6 nu	12C8 nu	14H7 n	35W4 u	50Y7 nu		
0D3 nu	1LE3 n	5U4 nu	6B7 nu	6L6 nu	6U5 u	7E7 nu	12F5 n	14J7 n	35Y4 u	51 nu		
0Y4 n	1LG5 n	5V4 nu	6B8 nu	6L7 nu	6U6 u	7F7 nu	12J5 nu	14N7 n	35Z3 nu	55 n		
0Z4 nu	1LH4 nu	5W4 nu	6BA6 nu	6N5 n	6U7 u	7F8 u	12J7 nu	14Q7 u	35Z4 u	56 nu		
1A3 n	1LN5 nu	5X4 nu	6BE6 nu	6N6 nu	6U8 nu	7G7 u	12K7 nu	19 nu	35Z5 nu	57 u		
1A4 nu	1N5 nu	5Y3 nu	6BJ6 nu	6N7 nu	6V6 nu	7H7 u	12K8 n	22 u	35Z6 nu	58 u		
1A5 nu	1P5 nu	5Y4 nu	6C4 n	6P5 nu	6V7 nu	7K7 nu	12L6 nu	24A nu	36 u	59 u		
1A6 n	1Q5 nu	5Z3 nu	6C5 nu	6Q7 nu	6W6 nu	7L7 nu	12Q7 nu	25A6 nu	37 u	70A7 n		
1A7 nu	1R5 nu	5Z4 nu	6C6 nu	6R7 nu	6X4 nu	7N7 nu	12SA7 nu	25A7 nu	38 nu	70L7 u		
1B5 nu	1S4 n	6A4 nu	6C7 n	6S4 n	6X5 nu	7Q7 u	12SC7 n	25B6 u	39 nu	71A u		
1C5 nu	1S5 nu	6A5 n	6C8 nu	6S7 nu	6Y5 u	7S7 nu	12SF5 n	25C6 u	40A1 u	75 u		
1C6 nu	1T4 u	6A6 nu	6D6 nu	6S8 n	6Y6 nu	7V7 n	12SF7 n	25L6 nu	40Z5 u	76 nu		
1C7 u	1T5 nu	6A7 u	6D7 n	6SA7 nu	6Y7 u	7X7 u	12SG7 u	25S nu	41 nu	77 nu		
1D5 u	1U4 nu	6A8 nu	6E5 u	6SB7 nu	6Z4 nu	7Y4 nu	12SH7 n	25Z5 nu	42 u	78 u		
1D8 nu	1U5 u	6AB7 nu	6E6 nu	6SC7 nu	6ZY5 nu	7Z4 nu	12SJ7 nu	25Z6 nu	43 u	79 nu		
1D21 n	1V u	6AC5 nu	6E7 u	6SD7 nu	7A4 nu	12A5 n	12SK7 nu	26 u	44 nu	80 nu		
1E7 n	2A3 nu	6AC7 nu	6F5 nu	6SF5 nu	7A5 nu	12A6 n	12SL7 nu	26A7 n	45 u	81 u		
1F4 n	2A4 nu	6AD6 n	6F6 nu	6SF7 n	7A6 nu	12A7 nu	12SN7 nu	27 u	45Z3 n	84 nu		
1F6 u	2A5 u	6AF6 nu	6F7 u	6SG7 nu	7A7 nu	12A8 u	12SQ7 nu	28D7 nu	45Z5 nu	85 nu		
1G4 nu	2A6 u	6AG7 nu	6F8 nu	6SH7 nu	7A8 nu	12AH7 nu	12SR7 nu	30 u	46 n	89 nu		
1G5 u	2B7 nu	6AK5 nu	6G5 u	6SJ7 nu	7AF7 u	12AL5 u	12V6 nu	31 nu	47 u	117L7 nu		
1G6 nu	3A4 nu	6AK6 n	6G6 nu	6SK7 nu	7AG7 nu	12AT6 n	12Z3 nu	32 nu	48 n	117Z3 n		
1H4 u	3A5 nu	6AL5 nu	6H6 nu	6SL7 nu	7AK7 u	12AT7 nu	14A4 n	32L6 u	49 n	117Z4 u		
1H5 n	3A8 n	6AL7 u	6J5 nu	6SN7 nu	7B4 nu	12AU6 nu	14A7 u	32L7 nu	50A5 nu	117Z6 nu		
1H6 nu	3B2 u	6AQ5 nu	6J6 nu	6SQ7 nu	7B5 u	12AU7 nu	14B5 n	33 nu	50B5 nu	884 n		
1J6 u	3C6 n	6AT6 nu	6J7 nu	6SR7 u	7B6 nu	12AX7 nu	14B6 u	34 nu	50C5 nu	955 n		
1L4 n	3Q4 nu	6AT8 nu	6J8 u	6SS7 n	7B7 u	12B7 nu	14B8 n	35 nu	50C6 n	9002 n		
1LA4 n	3Q5 nu	6AU6 nu	6K5 nu	6SU7 n	7B8 u	12B8 u	14C5 n	35A5 nu	50L6 nu	9003 n		
1LA6 u	3S4 nu	6AV6 nu	6K6 nu	6SV7 n	7C5 u	12BA6 nu	14C6 n	35B5 n	50X6 u	XXB n		
1LB4 u	3V4 nu	6B4 nu	6K7 u	6S7 u	7C6 u	12BE6 nu	14F7 n	35C5 nu	50Y6 n	XXL nu		
1LC5 n	5R4 u	6B5 nu	6K8 u	6T7 u	7C7 u	12C5 u	14F8 n	35L6 nu	50Y7 nu	XXFM nu		

If you do not see the tube type which you seek listed herein, send self addressed stamped envelope for List 8A which contains OLD-STYLE-ENVELOPE TUBES, RARE COLLECTOR TYPES, & RECENT TYPE NUMBERS.
TUBE COLLECTOR SPECIALS -- type 10 - $5.00, 12 - $4.00, 40 - $4.00, 50 - $5.00, 205D - $5.00, 212 - $30.00, 216A - $8.00, 401 - $8.00, 852 - $25.00 ----- Write for details.
FOR SALE -- (1) COMPLETE SET OF RIDER MANUALS - Diagrams of most old radios - Write for details.
(2) TAPES OF OLD RADIO SHOWS - send self addressed stamped envelope for price list.
WANTED --- Information on and literature produced by McMurdo Silver & E.H. Scott companies.